



TAMIL NADU ELECTRICITY REGULATORY COMMISSION

Notification No. TNERC/F&S Wind, Solar & hybrid/1/2024 Dt. 22-01-2024

In exercise of the powers conferred by Sections 86(1) and 181(2)(zp) read with Sections 32 and 33 of the Electricity Act, 2003 (Central Act 36 of 2003) and all other powers enabling it in this behalf, the Tamil Nadu Electricity Regulatory Commission is hereby makes the following Regulations, the draft of the same having been previously published, as required under sub-section (3) of the section 181 of the Act.

REGULATIONS

1. Short Title, extent and commencement

1.1 These Regulations may be called the "Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2024".

1.2 These Regulations shall come into force from the date of publication in the Tamil Nadu Government Gazette and the commercial implementation of this Regulation shall commence from 01-04-2024.

1.3 These Regulation extend to the whole of State of Tamil Nadu.

2. Definitions

2.1 In these Regulations, unless the context otherwise requires,

(a) "**Absolute Error**" means the difference between the actual generation injected and the scheduled generation of Wind or Solar Energy Generators in relation to their

scheduled generation in each time block, and may be computed in percentage terms by applying the following formula:

$$\text{Absolute Error (\%)} = 100 \times \frac{[\text{Actual Generation} - \text{Scheduled Generation}]}{\text{Scheduled Generation}}$$

Where, scheduled generation $\neq 0$

(b) **"Act"** means the Electricity Act, 2003 (36 of 2003), as amended from time to time;

(c) **"Actual Drawal"** in a time block means the electricity drawn by a Procurer, as measured by the interface meters;

(d) **"Actual Injection/Generation"** in a time block means the electricity generated and injected into the Grid by a Generator(s), as measured by the interface meters;

(e) **"Central Commission"** means the Central Electricity Regulatory Commission constituted under sub-section (1) of Section 76 of the Act, 2003;

(f) **"Collective transactions"** shall have the same meaning as in the Indian Electricity Grid Code specified by the Central Electricity Regulatory Commission;

(g) **"Commission"** means the Tamil Nadu Electricity Regulatory Commission constituted under sub-section (1) of Section 82 of the Act, 2003;

(h) **"De-Pooling"** means the disaggregation and apportionment of the deviations and the applicable charges among the Generators at a Pooling Sub-Station;

(i) **"Deviation"** in a time block means the difference between the actual injection of energy and scheduled generation;

(j) **"Distribution Licensee"** means the Distribution Licensee as defined in Section 2(17) of the Electricity Act, 2003;

(k) **"Forecasting"** means the projection of likely future electricity generation based on scientific analysis of meteorological data and other relevant parameters;

(l) **"Gaming"** in relation to these regulations, shall mean an intentional mis-declaration of scheduled generation by any generator/QCA in order to make an undue commercial gain through Charges for Deviation.

(m) **"Generating Company or Generator"** shall mean the generating company as defined in Section 2(28) of the Electricity Act, 2003;

(n) **"Grid Code"** means the State Grid Code specified by the Commission under Section 86(1) (h) of the Act;

(o) **"Indian Electricity Grid Code" (or "IEGC")** means the Grid Code specified by the Central Electricity Regulatory Commission under Section 79(1)(h) of the Act;

(p) **"Interface Meter"** means interface meters as defined by the Central Electricity Authority under the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, as amended from time to time;

(q) **"Inter-connection point"** means the interface point of a generation facility with the transmission or distribution system, in relation to a Wind or Solar Energy facility, and shall mean the line isolator on the incoming feeder on the Low Voltage (LV) side of the Pooling sub-station, for the purposes of these Regulations;

(r) **"Pooling Sub-Station"** means a sub-station consisting of a step-up transformer and associated switchgear to the Low Voltage (LV) side of which several Wind or Solar Energy Generators are connected:

Provided that, where a Generating Unit is connected through a common or an individual feeder terminating at a Sub-Station of a Distribution Licensee, or the State Transmission Utility, such Sub-Station shall be treated as the Pooling Sub-Station for such Wind or Solar Energy Generator for the purposes of these Regulations;

(s) **"Procurer"** means a person, including a Distribution Licensee, Trading Licensee or an Open Access consumer, procuring electricity through a transaction scheduled in accordance with the Regulations governing Open Access;

(t) **"Qualified Co-ordinating Agency" (or "QCA")** means the agency appointed by the majority of the Wind or Solar Energy Generators connected to a Pooling Sub-Station in terms of installed capacity, or by an individual Generator connected directly to a sub-station where no other generators are connected or a single agency appointed by the majority of the Wind or Solar Energy Generators in the State in terms of installed capacity, to perform the functions and discharge the obligations specified in these Regulations;

(u) **"Scheduled Generation"** for a time block or other time period, means the Schedule of generation in MW or MWh ex-bus provided by the QCA(s)/Generator(s);

(v) **"Scheduled Drawal"** for a time block or other time period means the Schedule of drawal in MW or MWh ex-bus provided by the State Load Despatch Centre;

(w) **"State"** means the State of Tamil Nadu;

(x) **"State Deviation Pool Account (Wind and Solar)"** means the State Account for receipts and payments on account of deviations by Wind and Solar Energy Generators;

(y) **"State Deviation Pool Account (DSM)"** means the State Account maintained by the State Load Despatch Centre for receipts and payments on account of deviations by buyers and sellers;

(z) **"State Entity"** means such person who is in the SLDC control area and whose metering and energy accounting is done at the State level;

(aa) **"State Load Despatch Centre" (or "SLDC")** means the Load Despatch Centre of Tamil Nadu established under Section 31(1) of the Act and responsible for coordinating the scheduling of the State Entities in accordance with the provisions of the State Grid Code;

(ab) **"Time block"** means a period of 15 minutes or any such shorter duration as may be notified by Central Commission and State Commission for which specified electrical parameters and quantities are recorded by a energy meter, with the first time block starting at 00.00 hrs., or such other period as the Commission may stipulate.

Words or expressions used and not defined in these Regulations shall have the meaning assigned to them in the Act, or the Rules or other Regulations framed thereunder.

PART A- GENERAL

3. Objective

3.1. These Regulations are intended to facilitate Grid integration of Wind and Solar energy generated in Tamil Nadu while maintaining Grid stability and security as envisaged under the State Grid Code and the Act, through forecasting, scheduling and a mechanism for the settlement of deviations by such Generators.

3.2. In order to maintain system security, stability and reliability, the SLDC shall take into consideration the forecasts of Wind and Solar generation for Week-Ahead, Day-Ahead and Intra-Day operations and scheduling, and longer term forecasts for its planning.

3.3. The SLDC shall make use of the flexibility provided by conventional Generating Units and the capacity of inter-Grid tie-lines to accommodate Wind and Solar energy generation to the largest extent possible subject to Grid security.

4. Applicability

4.1 These Regulations shall apply to all Wind and Solar Energy Generators including hybrid (wind and solar) systems (excluding Grid Interactive Solar PV Energy Generating System projects (Rooftop PV Solar power projects) of capacity less than 1 MW) in Tamil Nadu connected to the Intra-State Transmission System or Distribution System, including those connected through Pooling sub-stations, and using the power generated for self-consumption or sale within or outside the State.

4.2 The Commission shall review these Regulations including formulation for Absolute Error, Accuracy Band and Deviation charge thereof after two years, or earlier if it considers necessary.

PART B - TECHNICAL ARRANGEMENTS: FORECASTING AND SCHEDULING CODE

5. Forecasting and Scheduling Code

5.1. The Wind / Solar Energy Generators shall appoint a QCA to represent on their behalf and comply with the requirements of forecasting and scheduling separately.

Provided that the QCA appointed by the majority of the generators in the State shall be engaged as a single QCA for all wind and solar generators separately in the State for

forecasting and scheduling activities and the terms and conditions for engagement of single QCA shall be governed by the mutual/inter-se agreement between the respective generators and the QCA.

Provided that the wind/solar generators who do not wish to avail the services of the single QCA of the State / QCA of the Pooling Sub-Station appointed by the majority of the concerned generators and not covered under Regulation 6.2 (a) and (b) shall have the option to avail the services of the SLDC for forecasting and scheduling services subject to the condition that such generators will be responsible for the remaining part of works assigned to QCA as defined in the Regulation 2(t). However, multiple QCA(s) for single pooling sub-station will not be permitted.

Provided that the service charges for forecasting and scheduling services along with applicable taxes shall be payable to the QCA(s) / SLDC by the generators as the case may be.

Provided that an individual Generator alone connected to a sub-station that is designated as a Pooling sub-station as defined in 2(r) of this regulation may opt to function as a QCA on its own or appoint a separate entity as its QCA.

5.2. This Regulation mandates appointment of QCA by the wind and solar generators for forecasting and scheduling activities. If the generators fail to appoint the QCA within the time frame stipulated in the notice to be issued by the SLDC as per the Regulation 5.22 (h), then the SLDC shall issue a second notice to such generators for appointing QCA within a period of 90 days. The deviation settlement charges shall be collected from such generators at 125% of the capped price for energy injected into the grid from the date of commercial operation of this Regulation. Further, if the generator does not appoint QCA beyond 90 days, such generator will be charged at 150% of the capped price apart from collecting forecasting and scheduling charges from his monthly bill till the generator appoints QCA.

Provided that if the power is injected by the generator(s) without scheduling after appointing the QCA, the SLDC will make forecasting and scheduling on behalf of the generator(s) and the deviation settlement charges will be collected from those generator(s) at **125%** of the capped price for such energy injected. Necessary charges for such forecasting and scheduling services offered by the SLDC will be included in the generator(s)' monthly bill by the distribution licensee.

5.3. This Forecasting and Scheduling Code specifies the methodology for Day-Ahead /intra-day scheduling of Wind and Solar Energy Generators connected to the intra-State Transmission Network (Transmission and Distribution system), its revisions on a one and a half hourly basis, and the treatment of their deviations from such Schedules. Wind and Solar generators, either by themselves or represented by Qualified Coordinating Agencies shall comply with the requirements of Forecasting and Scheduling Code as stipulated under these Regulations.

5.4. The QCA(s) shall be treated as State Entity for the purpose of this Regulation.

5.5. Every QCA shall be registered with the SLDC along with the authorization of the majority of respective wind and solar generators. The qualifying criteria and fee for registration of the QCA with the SLDC shall be specified in the Detailed Procedure to be issued by the SLDC, which will be approved by the Commission separately within the period as specified in the Regulation 5.21.

5.6. Notwithstanding the appointment of a QCA, the duties and obligations of complying with the relevant provisions of these Regulations shall remain with the concerned Generators and the commercial and other terms and conditions between the Generators and their QCA shall be governed by their inter-se agreements or terms of engagement.

5.7. The QCA shall be appointed by the Generators for the purposes specified in these Regulations, including but not limited to the following:

(a) Aggregation of scheduled generation of the generators, meter reading and data collection and its communication, and co-ordination with the Distribution Licensees, the SLDC and other agencies.

(b) De-pooling of Deviation Charges within the constituent Generators as per the mutual / inter-se agreement between the respective generator(s) and the QCA and intimating the deviation charges to the SLDC, Distribution Licensee and the respective generators.

(c) In the case of single QCA for the State chosen by the wind/solar generators, such single QCA is responsible for state level aggregation of scheduled generation for captive adjustment / selling out power within Tamil Nadu and outside Tamil Nadu separately. In case of engaging multiple QCAs by the generators, the respective QCA for each pooling station is responsible for providing schedule for their generators concerned for captive adjustment / selling out power within Tamil Nadu and outside Tamil Nadu separately.

(d) The minimum term period of agreement between the QCA and the wind/solar generators shall be two years. Until new arrangement is put in place, existing QCA shall continue for further period up to 1 year.

(e) The SLDC in its detailed procedure shall specify the qualification and other criterions viz., Business Rules/Net worth requirement, experience, etc. for the QCA.

5.8. The QCA shall be the Nodal Agency between the SLDC and its Generators for the purposes of these Regulations.

5.9. The QCA shall furnish the technical specifications of the Generators whom it represents to the SLDC in the prescribed format, at the time of its registration or within such period thereafter as may be stipulated by the SLDC in its Detailed Procedure, and also furnish details whenever there is a change in these specifications.

5.10. The QCA shall provide real-time data relating to the power generation parameters and weather-related data, as maybe required to the SLDC.

5.11. QCA(s) shall ensure that meters with the AMR facility and uninterrupted data transmission shall be installed for energy accounting in accordance with the relevant provisions of the Central Electricity Authority (Installation and Operation of meters) Regulations, 2006 and its amendments, governing metering for the transfer of information to the SLDC by the Generators.

5.12. The QCA shall furnish to the SLDC forecasts relating to its Wind Energy Generators and Solar Energy Generators connected to intra-State system and contracts undertaken for sale of power through intra-State or inter- State, as the case may be, separately, in the formats specified for each type of source and intra/inter State transaction in the detailed procedure provided by SLDC.

5.13. The SLDC may also undertake forecasting of the Wind and Solar energy generation expected to be injected into the intra-State Transmission network at each Pooling sub-station, by engaging forecasting agencies if required, so as to enable it to plan better for balancing resources required for secured Grid operation.

5.14. The QCA(s) shall provide the separate Schedules of all Wind / Solar generators connected to the intra-state network / Pooling sub-station and communicate to the SLDC.

Provided that in case of single QCA, the QCA shall aggregate the generation of all wind/solar generators separately for the entire State and communicate as single separate schedule for wind and solar respectively to the SLDC for each time block with respect to intra and inter-state transactions. However, the Pooling sub-station wise schedule shall be made available to the SLDC.

5.15. If the QCA has difficulty to aggregate the generation of wind/solar for the entire State, it may provide schedules for each pooling station individually and in such case, the deviation charges will be calculated pooling sub-station wise.

5.16. The QCA shall provide SLDC with a Schedule based on its own forecast, which shall be the reference Schedule for the purposes of deviation determination and settlement.

Provided that, if the QCA opts to adopt the forecast of the SLDC, the consequences of any error in such forecast which results in deviations from scheduling shall be borne by the concerned QCA only.

5.17. The charges towards the forecasting and scheduling services provided by the QCA(s) to the generators shall be mutually agreed between them and such charges shall be paid by the Generators to the concerned QCA directly.

5.18. The QCA shall provide to the SLDC a Day-Ahead and a Week-Ahead Schedule to enable it to assess the Availability of energy and the margin available in the State Grid. In case of state wide aggregation, the QCA shall provide the forecast considering the generation measured at the metering points provided at the interconnection points / generating stations as the case may be.

Provided that the QCA shall internally maintain the schedule for each pooling sub-station and the same to be furnished to the SLDC.

5.19. The Day-Ahead Schedule shall comprise of the Wind or Solar energy generation to be scheduled in each 15-minute time block starting from 00:00 hours of the following day, and for all 96 time blocks of that day and the Week-Ahead Schedule shall contain the same information for the next seven days.

5.20. (a) The QCA may revise the Schedule of Generators connected to the Intra-State Transmission Network (excluding collective transactions) by giving advance notice to the SLDC.

(b) Such revisions shall be effective from the 6th time block following the time block in which notice was given.

(c) There may be one revision for each time period of one and half hours starting from 00.00 hours of a particular day, subject to a maximum of 16 revisions during the day.

5.21 The formats of forecast submission and other modalities and requirements shall be stipulated in the Detailed Procedure to be submitted by the SLDC within a month from the date of issuance of this Regulation, which the Commission shall endeavor to approve within 15 days thereafter.

Provided that, SLDC shall undertake stakeholder consultation by uploading the Draft procedure on SLDC's website before submission of procedure to the Commission for approval and such draft procedure for approval shall be accompanied by the comments of stakeholders and response of SLDC thereto in a tabulated form.

5.22 The Detailed Procedure mentioned in Regulation 5 (21) shall contain the following:

(a) The procedure and requirements, including the payment of fees and penalties, for the registration and de-registration of QCAs by the SLDC;

- (b) The information and data, and the formats required by the SLDC from the QCA(s) are to be provided by the SLDC to them;
- (c) The mode and protocol of communication for exchange of information and data between the QCAs and the SLDC;
- (d) The guidelines for energy and deviation accounting of Wind and Solar energy transactions under the State energy accounting framework, with illustrative examples, in accordance with the principles specified in these Regulations;
- (e) The mechanism for monitoring compliance of the Forecasting and Scheduling by the QCAs;
- (f) The default conditions in the State Pool Settlement by QCAs and their treatment;
- (g) Payment security mechanism in the form of Letter of Credit in favour of SLDC by the Generator(s) / QCA(s) as the case may be with the SLDC;
- (h) Advance one month notice to be issued to all the generators insisting to appoint QCA before the date of commercial operation;
- (i) Qualification and other criterions for the QCA;

5.23 The commercial impact of deviations from Schedules based on the forecasts shall be borne by the Generators.

5.24 The State entities shall operate their equipments and loads in a manner that is consistent with the provisions of the Indian Electricity Grid Code and the Tamil Nadu Electricity Grid Code.

5.25 Treatment to Gaming

(a) Any intentional mis-declaration or understatement of Scheduled Generation to the SLDC by the QCA for its own undue commercial gain or that of a Generator or for avoiding risk associated with forecast shall be considered as gaming and shall constitute a breach of these Regulations.

(b) Upon identification of gaming by SLDC if any, such as intentional mis-declaration of scheduled generation, the QCA / Generator shall be liable to pay a penalty of three times of deviation charges that would have been applicable had the Scheduled Generation been correctly declared.

(c) The amount of penalty shall be payable by the QCA(s)/Generator(s) to the State Deviation Settlement Mechanism (DSM) Pool as per the procedure to be issued by the SLDC.

(d) The SLDC may, after giving due notice, as stipulated in the Detailed Procedure, cancel the registration of the QCA upon repeated events of mis-declaration.

(e) If the scheduled generation is zero and if there is actual generation in a particular 15 minutes block by the wind/solar generator(s), the deviation settlement charges will be collected from those generator(s) at 125% of the capped price for such energy injected.

6. Principles of appointment of QCA

6.1. The Generators connected to each Pooling Sub-Station shall appoint a person / entity as a (i) Single QCA for whole State or (ii) QCA for the particular PSS to which the generators are connected or (iii) Opt SLDC for adopting their forecast as stipulated in Regulation 5.1.

Provided that the QCA appointed by the majority of the Generators for a particular Pooling Sub-Station shall be a Deemed QCA for all generators of that Pooling Sub-Station.

Provided further that the same QCA can be appointed for any number of Pooling sub-station, whereas multiple QCAs for single Pooling sub-station will not be permitted.

Provided further that such appointment of QCA(s) shall be made by the Generators within one month from the date of intimation by the SLDC, failure of which shall attract the conditions stipulated in the Regulation 5.15.

6.2. The appointment of QCA shall be made in the following ways-

- a) Single QCA for State wide aggregation appointed by the majority of the wind/solar Generators separately in terms of their installed capacity;
- b) QCA for each Pooling Sub-Station appointed by the majority of the generators connected to such Pooling Sub-Station in terms of their installed capacity. The QCA of a Pooling Sub-Station can also be a QCA for other Pooling Sub-Stations.
- c) In any Pooling Sub-Station where only one Generator is connected such Generator can act as QCA on his own or appoint any other agency as QCA.

6.3. The Generators shall satisfy themselves that the QCA is technically and financially competent to undertake on their behalf the functions and discharge the obligations specified in these Regulations.

6.4. The terms of engagement of the QCA shall include provisions on the following aspects:

- a) The respective roles and responsibilities of the QCA and Generators;
- b) The metering, billing and energy accounting arrangements;

- c) The modalities for recovery of Deviation Charges from the Generators and their settlement, including the principles for de-pooling;
- d) The payment security mechanism and related provisions;
- e) The events of default and their mitigation;
- f) The charges for providing scheduling and forecasting services to the generators shall be settled mutually by themselves.

PART C - COMMERCIAL ARRANGEMENTS

7. Deviation Settlement for Intra-State Transactions

7.1 The sale of power within Tamil Nadu by Wind and Solar Energy Generators connected to the Intra-State Transmission Network shall be settled by the Procurers on the basis of the actual generation, and the Deviation Settlement shall be undertaken by the respective generators as specified in these Regulations. The generators are liable to pay provisional deviation charges in every monthly bill at the capped price as determined in Regulation 7.2 for the total units of generation during the billing month and the final settlement at the end of the financial year shall be carried as set out therein.

7.2 In respect of sale or self-consumption of power within Tamil Nadu, if the actual injected generation of wind or solar power differs from the scheduled generation, the Deviation Charge for the excess or shortfall shall be payable by the Generator to the "State Deviation Pool Account (Wind and Solar)", through the SLDC, as specified in the Tables:

Table 1: Deviation Charge for under or over injection of wind power, for sale or self-consumption of power within Tamil Nadu.

Sl. No.	Absolute error in % terms in 15 minute time block	Deviation charge payable to state deviation pool account (wind and solar)
1	<= 15%	Nil

2	>15%but <=20%	At Rs.0.25 per unit
3	>20% but <= 30%	At Rs.0.25 per unit for the shortfall or excess beyond 15% and upto 20% + Rs. 0.50 per unit for the balance energy beyond 20% and upto 30%
4	>30%	At Rs. 0.25 per unit for the shortfall or excess beyond 15% and upto 20% + Rs. 0.50 per unit for the shortfall or excess beyond 20% and up to 30% + Rs.1.25 per unit for the balance energy beyond 30%

Table 2: Deviation Charge for under or over injection of solar power, for sale or self-consumption of power within Tamil Nadu.

Sl. No.	Absolute error in % terms in 15 minute time block	Deviation charge payable to state deviation pool account (wind and solar)
1	<= 10%	Nil
2	>10% but <= 20%	At Rs.0.25 per unit
3	>20% but <= 30%	At Rs.0.25 per unit for the shortfall or excess beyond 10% and upto 20% + Rs. 0.50 per unit for the balance energy beyond 20% and upto 30%
4	>30%	At Rs. 0.25 per unit for the shortfall or excess beyond 10% and upto 20% + Rs. 0.50 per unit for the shortfall or excess beyond 20% and up to 30% + Rs.1.25 per unit for the balance energy beyond 30%

The total deviation charges remitted on account of deviations by wind / solar generator(s) into State Deviation Pool Account (wind and solar) in a financial year shall be capped at the Ceiling Rate of 3 paise per unit multiplied by the total annual generation at the respective Pooling sub-station(s)/total generated units in state wide aggregation. Any excess amount of deviation charges remitted beyond the capped amount as per deviation account statement over the financial year shall be adjusted in the subsequent billing without interest.

Provided that the Commission may refix the ceiling rates as stipulated in the Regulation 4.2.

7.3 The SLDC and the QCA shall maintain records and accounts of the time block-wise Schedules, the actual generation injected and the deviations, for each Pooling sub-station, the individual Generators and state wide aggregation separately.

7.4 The QCA shall undertake de-pooling of the energy deviations and the Deviation Charges against each Generator as specified in Regulation 14.

7.5 The concerned Generators shall undertake the settlement of the Deviation Charges with the SLDC through Distribution Licensee.

7.6 The deviations due to forced shut down of Generating Plant arising out of abnormal weather conditions like cyclone, heavy rainfall, flood, gusty wind, if intimated by the QCA to the SLDC well before six hours of occurrence shall be excluded from the scope of deviation charges upon verification by the SLDC.

8. Deviation Settlement for Inter-State Transactions

8.1 The sale of power outside Tamil Nadu by Wind and Solar Energy Generators connected to the Intra-State Transmission system or Distribution system shall be settled by the Procurers on the basis of CERC Regulation. The QCA/Generators shall not be allowed to aggregate their inter-state transaction schedule with intra-state transactions.

8.2 Inter-State transactions at a Pooling sub-station shall be permitted only if the concerned Generator is connected through a separate feeder/metering arrangements.

8.3 Generator intending to enter inter-state transaction shall submit, through the QCA, a separate Schedule for its energy generation, in accordance with these Regulations, to the SLDC and the concerned Regional Load Despatch Centre (RLDC).

8.4 The SLDC shall prepare the deviation settlement account for such QCA on the basis of measurement of the deviation in the energy injected.

8.5 The Deviation Charges for Over / under-injection by Generators connected to the Intra-State Transmission Network and selling power outside Tamil Nadu shall be as per the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2022 and the amendments issued time to time for which, the accounting shall be done by the SLDC separately.

9. Deviation Settlement for Inter and Intra-State transactions; other provisions

9.1 Deviations in respect of Inter-State and Intra-State transactions for each source of Renewable Energy i.e. wind and solar Generation shall be accounted for separately at each Pooling Sub-Station or at state level.

9.2 The SLDC shall compute the deviations with reference to the scheduled generation and actual generation and determine the Deviation Charges payable by the Generators and bill accordingly on monthly basis for intra-state transactions.

9.3. In respect of inter-state transaction, the SLDC shall compute the deviations with reference to the scheduled and actual generation and determine the deviation charges payable/receivable as the case may be and monthly deviation statement will be published on the SLDC website for viewing by QCA(s)/generator(s) and the QCA/Generator(s) shall make payment to the State deviation pool account (wind and solar)

9.4 The charges collected in the State Deviation Pool account (wind and solar) in respect of both inter-state and intra-state transactions shall be utilized to offset the shortfall in the State Deviation Pool Account (DSM).

9.5 The SLDC shall provide separate energy and Deviation Accounts for Inter-State and Intra-State transactions in respect of wind and solar Generation to the respective QCA, who shall arrange to settle the Deviation Charges by the concerned Generators.

PART D- IMPLEMENTATION ARRANGEMENTS

10. Metering

10.1 Every Pooling Sub Station / Generator shall have energy meter (main and check) capable of recording the energy in time blocks as specified in the CEA Regulations governing metering. The meters shall be time synchronized through command instruction from the centralized Automated Meter Reading system.

10.2 The data from existing AMR metering arrangements available with SLDC will be shared with QCA(s) appointed by generators. The QCA(s) shall make their own arrangements to capture, transfer and analyse the respective data shared by SLDC without disturbing the working of their system. QCA shall develop a web portal and provide access to respective stakeholders to monitor real time schedule versus actual generation details. The SLDC, on request of QCA(s), shall provide real time data for the purpose of supplementing the forecasting activities by the QCA(s). However, the error that may arise in such forecasting shall be entirely attributable to the QCA(s). In case, when the AMR system is inoperable, the appropriate Licensee shall provide the weekly 15 minutes time block data to the SLDC for calculation of DSM charges for wind/solar generators within 3 working days from the date of receipt of such request from the SLDC. It shall be ensured that the generation meters (main/check) are healthy all the time to the extent possible. In the event of non-availability of meter data, the assessment of generated units shall be assessed as per the historical data for the relevant period. The defective meter, if any, shall be replaced by the generator within

30 days and if it is not replaced within such time period, the licensee concerned shall replace the meter with new one and the necessary charges will be adjusted in the generator's monthly bill.

10.3 The SLDC will provide generation readings for each 15-minutes time block on a monthly basis to QCA and such data shall be shared within the stipulated period as prescribed in the detailed procedure for every month.

10.4 The QCA shall consolidate meter readings provided by SLDC, compare with scheduled generation and report deviations on monthly basis to the SLDC.

10.5 The deviation charges shall be calculated by the SLDC based on the details of 'Scheduled Generation' and 'Actual Generation' in 15 minutes block wise.

10.6 For hybrid (wind/solar) system, the metering arrangements for wind and solar generation shall be made separately and accordingly, deviations for wind and solar will be considered separately. The respective metering system shall be as per the Central Electricity Authority (Installation and Operation of meters) Regulations, 2006 and the amendments issued thereon.

11. Communication of QCA with SLDC

11.1 The Detailed Procedure prescribed by the SLDC shall set out the protocol for communication and exchange of information between the QCA and the SLDC, including but not limited to the following aspects:

a) Communication of the Day-Ahead, Week-Ahead Schedule and intra-Day schedule and any revisions to the SLDC.

b) Communication of the time block-wise scheduled and actual generation data at the Pooling Sub-Station(s).

c) Communication of Grid constraints and curtailments by the SLDC to the QCA.

11.2 The SLDC shall equip itself with the necessary Information Technology (IT) enabled communication platform and software for communication between it and the QCA.

11.3 The QCA shall provide the IT-enabled communication software log-in details to enable the SLDC to access live data of all Schedules and deviations of all the generators.

11.4 The IT-enabled communication platform and software should enable the SLDC and QCA to exchange information, including but not limited to the following:

- a) Generator outages and their reasons;
- b) Deviation Charges payable/receivable by the QCA, SLDC and the Distribution Licensee;
- c) Site characteristics and details of the Wind Turbines, Solar Inverters, etc.;
- d) Schedules and generation handled by the QCA including Pooling sub-station /Generator wise data.

12. Deviation Accounting

12.1 The methodology for deviation settlement for the State shall be as follows:

- a) The SLDC shall compute the Absolute Error, i.e. the difference between the actual generation and the scheduled generation injected, in respect of statewide aggregation or each Pooling Sub-Station or each generator and shall accordingly determine the amounts payable/receivable on account of the Deviation Charge in accordance with Regulations 7 and 8.

b) The Deviation Charges payable or receivable for the State as a whole at the State periphery shall be computed by the SLDC.

c) The SLDC shall also compute the impact of the deviation of the Wind and Solar Energy Generation and its contribution to the Deviation Charge at the State periphery and maintain State Deviation Pool Account (Wind and Solar) for both intra-state and inter-state transactions separately for the same.

13. Payment Mechanism for Deviation Settlement and Payment security

13.1 Every Generator shall pay the total amount of Deviation Charges for the respective months on statewide aggregation /PSS wise/ Generator wise to the SLDC as mentioned in the Regulation 7.

13.2 The generators shall pay the amount towards the deviation charges provisionally based on the ceiling amount as fixed in the Regulation 7.2 for each unit of generation on a monthly basis based on the actual generation obtained through AMR/CMRI readings. The generators shall either pay the deviation charges to the SLDC through the Distribution Licensee from the Generator's monthly bill.

13.3 If payments of the deviation charges is delayed beyond due date, a simple interest of 0.06% for each day of delay shall be levied. Further, any excess or shortfall in the deviation charges will be reconciled at the end of every financial year and collection from generators or refund / adjustment to generators shall be done by SLDC through distribution licensee within 60 days on completion of every financial year.

Provided that in case of delay in the Payment of Deviation Charges and interest thereon if any, beyond 12 days from the date of issue of the statement of charges for deviations, the QCAs/ generators who have to receive payments for earliest thereon, shall be paid from the balance available in the State Deviation Pool Account (Wind and Solar).

14. De-Pooling of Deviation Charges

The QCA shall de-pool the Deviation Charges against each Generator in proportion to their actual generation by the generators and report to SLDC for further action with regard to annual settlement of deviation charges.

15. Intimation of Curtailment

15.1 Any curtailment imposed on the energy injection for reliable and secure Grid operation in emergent situations shall be communicated by the SLDC to the QCA through an IT-enabled communication, and no Deviation Charges shall be payable on account of such curtailment.

15.2 In case of any curtailment planned and communicated by the SLDC due to line maintenance or other reasons in certain time blocks of a day, the QCA shall be responsible to intimate the respective generators for curtailing the generation at site and amending the Schedule accordingly, failing which the SLDC shall revise the Schedule as required.

15.3 The Commission shall issue "detailed procedure for management of RE curtailment for wind and solar generation" separately within 60 days from the date of issue of these Regulations.

16. Energy Accounting

16.1 The energy accounting shall be undertaken on the basis of the data recorded by the interface meters referred to in Regulation 10.

16.2 All accounts relating to deviations within pooling sub-station / statewide aggregation shall be prepared by the respective QCA on a monthly basis based on inputs from the SLDC, and be accessible to the SLDC through an IT-enabled system and software.

16.3 The SLDC shall furnish the processed data on a monthly basis to the concerned QCA in the prescribed format for the preparation of monthly accounts of energy from the Pooling Sub-Station/Generators.

16.4 Any discrepancy communicated by the QCA within 15 days shall be corrected forthwith by the SLDC after verification.

16.5 The SLDC/Distribution licensee as mutually agreed shall prepare the statement of accounting of energy in each (15 minutes) time block for the wind and solar energy generators and the procurers on monthly basis for the purpose of billing. The billing centre of the distribution licensee shall be responsible for energy accounting, adjustment, raising and settlement of bills with the procurers as per the procedure laid by the SLDC. But, the SLDC shall be responsible for sharing the block wise generation data to the Distribution Licensee.

16.6 A detailed energy accounting procedure shall be prepared by SLDC and submitted for approval to the Commission after undertaking stakeholder consultation in accordance to Regulation 5.22.

PART E– MISCELLANEOUS

17. Power to amend

The Commission may, at any time vary, modify or amend any provision of these Regulations.

18. Governance Structure and Constitution of State Power Committee

18.1 The Commission shall formulate State Power Committee within a month from date of notification of these Regulations. Subsequent to this, the SLDC shall formulate Operating Procedures and Business Rules for such Committee.

18.2 The State Power Committee shall-

- a) Co-ordinate and facilitate the intra-state energy exchange for ensuring optimal utilisation of resources.
- b) Monitor compliance of these Regulations by State Entities and submit annual compliance report in the prescribed format within thirty days from close of financial year.
- c) Guide the SLDC for modification of procedure(s) to address the implementation difficulties, if any.
- d) Provide necessary support and advice to the Commission for suitable modifications/issuance of operating procedures, practice directions, and suggest amendment to the provisions of these Regulations, as may be necessary upon due regulatory process.

Provided that non-constitution of State Power Committee due to any reasons or its absence at any point of time shall not in any way affect the powers and functions of the SLDC or render any provision or any order made or any action taken under these Regulations invalid.

19. Repeal and savings

19.1 Save as otherwise provided in these regulations, the "Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2019" and Procedures thereof shall stand repealed from the date of coming into force of this regulation.

19.2 Anything done or action taken or purported to have been done in pursuance of the provisions of the earlier "Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2019" shall be considered to be legal and valid.

19.3 Any rights and liabilities arising out of the earlier "Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2019" shall be settled within its framework.

20. Power to remove difficulties

If any difficulty arises in giving effect to the provisions of these Regulations, the Commission may, by general or specific order, make such provisions not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulty.

21. Power to relax

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected by grant of relaxation, may relax any of the provisions of these Regulations on its own motion or on an application made before it by an interested person.

22. Powers to Issue Directions

Subject to the provisions of the Act, 2003 and this Regulation, the Commission may, from time to time, issue orders and directions in regard to the implementation of the Regulation and procedure to be followed and various matters which the Commission has been empowered by this Regulation to specify or direct, as may be considered necessary in furtherance of the objective and purpose of this Regulation.



Secretary

Tamil Nadu Electricity Regulatory Commission

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Explanatory Statement explaining the reason and circumstances leading to the Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2024.

1. The Tamil Nadu Electricity Regulatory Commission (hereinafter referred as the "Commission") earlier notified the Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2019 vide Notification No. TNERC/F&S Wind & Solar/21-1, dt. 01-03-2019, which were published in the Tamil Nadu Government Gazette on 20-03-2019.
2. As per the above Regulations, the Wind/Solar Generators shall appoint 'Qualified Co-ordinating Agency' (QCA) for each pooling station on the principles of majority. The percentage of deviation was formulated to be based on the scheduled generation.
3. Earlier, the Central Commission had notified the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2014 and its amendments from time to time prescribed the deviation charges worked out on the average frequency of a time-block, which is applicable for inter-state transaction of power.
4. Meanwhile, the Central Commission vide Notification No.L-1/260/2021/CERC, date 14-03-2022 repealed the above 2014 Regulations and notified new Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2022.
5. The Central Commission while repealing the above said 2014 Regulations has dispensed with the concept of frequency linked deviation charges and introduced the new concept of charges for deviation. As per the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters)

Regulations, 2022, the normal rate of charges for deviation for a time block shall be equal to the highest of [the weighted average Area Clearing Price (ACP) of the Day-Ahead Market segments of all the Power Exchanges; or the weighted average ACP of the Real Time Market segments of all the Power Exchanges; or the Weighted Average Ancillary Service Charge of all the regions] for that time block.

6. The Central Commission has quoted in the Statement of Reasons of the Deviation Settlement Mechanism and Related Matters Regulations that instances such as low / no generation cases cannot be covered with scheduled generation. With due regard to these constraints and with a view to ensure optimum and genuine forecasting, the Central Commission has decided to define the error percentage normalized to available capacity.
7. Now, the formula for calculating the absolute error percentage was modified in order to bring the Deviation Settlement Mechanism more realistic. Particularly in RE rich states like Tamil Nadu, where the Available RE (wind and solar) Capacity has already crossed 15.85 GW, the probability of percentage of Absolute error as defined by the CERC is bound to be Nil, for any quantum of deviation from the schedule, if the "Available Capacity" were to be used in the denominator of the "Absolute error percentage" formula, thus defeating the core purpose of the Deviation Settlement Mechanism. This will provide better understanding of deviation from schedules and will be a good signal for improving the forecasting mechanism by the wind and solar generators / QCA(s).
8. Further, it would be more appropriate to find the absolute error percentage with the proper mathematical approach involving the relevant two components, viz. arrive the error percentage by dividing the absolute error (difference between actual and estimated value) by the estimated value (scheduled generation). The following points are also well taken while evolving the formula for Absolute error:

- a. The formula for percentage error should invariably ought to contain one of the two parameters in the numerator as well as in the denominator.
- b. The absolute error defined in the previous Regulation contains an unrelated parameter (Available Capacity) in the denominator.
- c. Grid requirements are planned duly taking into account of the forecast / schedules from RE generation on day ahead basis which will be taken into account together with other sources.
- d. Any deviation of such forecast in RE generation is burden to the system operator as well as utility. By dividing the deviation with available capacity as stated in the previous Regulations, the error becomes infinitesimal and the regulation becomes redundant or toothless.
- e. Further, the RE generation never reached its maximum capacity i.e. available capacity in practicality. In the state of Tamil Nadu having installed capacity of 15 GW of Solar and wind capacity, the maximum generation never exceeded more than 35% of 'Available Capacity'. A study by applying 'Available Capacity' in the denominator reveals that in most of the time blocks the variations are found to be within 10% deviations only. In such scenario, considering the 'Available Capacity' as a component in the denominator of the formula will not reflect the real percentage deviation and hence it is more appropriate to have the term 'Scheduled Generation' in the denominator. Therefore, the Commission proposed the formula of calculating the Absolute error percentage based on the 'Scheduled Generation' which is used to arrive the error percentage like other conventional generators. The formula provides level playing field for the generators and system operator to achieve the desired result of this Regulation.

9. The Central Electricity Authority, Ministry of Power vide File No.CEA-EC-15-13/3/2018-RA Division-Part(1)/134 has expressed its views to consider the

Absolute Error percentage in line with the CERC Regulations (Available Capacity in the denominator) considering the fact that wind/solar generation is difficult to be forecasted with much accuracy using the presently available tools and also that State RE generators should not be at a disadvantage. The Commission duly considering the disadvantages faced by the RE generators and to safeguard their interest has capped the deviation charges to the barest minimum of 3 paisa per unit.

10. The technology in forecasting the wind and solar energy is improved with software tools, accurate weather forecasting, etc., ever since the Central Commission introduced deviation settlement for wind and solar generation through CERC (Deviation Settlement Mechanism and Related Matters) Regulations, 2014 and therefore, the developers of the wind/solar energy must be in a better position in forecasting the wind/solar energy.
11. The whole purpose of the Deviation Settlement Mechanism is to bring more accuracy in forecasting RE power because of its infirm nature and to aid better grid management. Further, this Regulation will ensure more discipline among the RE generators, bring better load management and grid frequency within the limit as prescribed by the Indian Electricity Grid Code with the available resources.
12. The interest of the RE generators is protected in this Regulation by not imposing any deviation charges on account of deviations due to forced curtailment on the instruction issued by the SLDC. In addition to that, the Commission shall issue "detailed procedure for management of RE curtailment for wind and solar generation" separately in order to safeguard the interests of the Solar / Wind generators.
13. In view of the above, it is stated that the formula for Absolute Error percentage arrived in the Regulation 2.1(a) is in the interest of all stakeholders.

Furthermore, it satisfies all criterions and therefore Commission finds it more appropriate.

14. Also, it is felt that multiple QCAs within the State warrant multiple interaction points for SLDC for operationalizing the Scheduling and Deviation Settlement which is complicated and impractical. Therefore, it is better that single QCA can be selected by the Wind/Solar Generators separately by following the majority principles for statewide aggregation for seamless implementation. At the same time, the right and responsibility of the Generating Stations to forecast and schedule by themselves cannot be diluted and therefore, the opportunity to the solar/wind generators should also be given to select QCA at Pooling Sub-Station wise also. Therefore, the RE generators will have choice either to schedule directly with/without the help of SLDC or schedule through QCA for state wide aggregation or appointing QCA for each pooling sub-station on the principles of majority.
15. Considering the above changes in the technical, commercial and implementation mechanisms, Commission has found it appropriate to frame new Regulations for Forecasting, Scheduling and Deviation Settlement for Wind and Solar Generation and refix the ceiling rates for deviation of wind and solar energy based on the pilot study conducted by the SLDC and accordingly Commission has framed the Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2024 duly repealing the existing Regulations, 2019.

(By Order of the Tamil Nadu Electricity Regulatory Commission)



Secretary,

Tamil Nadu Electricity Regulatory Commission.

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